Trinity County Roads and Plantations Pilot Project

Scoping Proposal

Background

The vegetative communities in the vicinity of the project area represent a wide range of vegetation types at various seral stages, including upland mixed conifer, mixed conifer/hardwood, upland ponderosa pine, riparian oak woodland and grasslands, and chaparral and mixed shrublands. This project occurs in a range of stands from areas with prior timber harvest and fuel modifications to areas that have not been previously managed. Understory and surface vegetation is also highly varied and includes sprouting and seed-born shrubs, trees, grasses and forbs.

Currently, plantations are overgrown and in need of maintenance to reduce competition from shrubs and brush, as well as other conifers. Too much vegetative competition stunts growth, delaying achievement of late successional characteristics, and increases risk of mortality to insects and disease. Plantations are also at risk of loss from wildfire due to their contiguous structure and fuel levels. They are providing only poor to marginal habitat for the majority of Forest Service Sensitive or Federally-listed species on the Forest.

Approximately 60 percent of the project area has not experienced fire in over 100 years. Most of the project area has, therefore, experienced a high degree of departure from the mean pre-settlement fire return interval (ranging from 11 to 29 years, depending on vegetation type). While some areas (i.e. Indian Valley Road which burned in 1920, 1987, and/or 2008) may be closer to their mean pre-settlement fire return interval, fuel conditions in these areas are still capable of producing high-intensity fire behavior and high-severity fire effects. The fuel types that describe the majority of the project area are timber litter and timber with a shrub or small tree understory. Areas of grass, or a combination of grass and shrubs, account for roughly a quarter of the burnable vegetation. Depending on weather and fuel moisture conditions, current fuel profiles could create challenges for ingress, egress, and fire suppression capability within the project area.

Project Location

The project area lies between two communities at risk, Hayfork and Hyampom, CA, categorized as Intermix Community in the Federal Register: Volume 66 Number 3, January 04, 2011.

> The Intermix Community exists where structures are scattered throughout a wildland area. There is no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres. Fire protection districts funded by various taxing authorities normally provide life and property fire protection and may also have wildland fire protection responsibilities. An alternative definition of intermix community emphasizes a population density of between 28-250 people per square mile.

Trinity County Collaborative Group

In 2012 with support from numerous local partners, the Trinity County Board of Supervisors created a collaborative group to work on natural resource management issues. In early 2013, the Secretary of Agriculture, Tom Vilsack, and a team from USDA visited Trinity County to discuss

the local situation and offer support from the national level. Since the USDA visit, and after a series of exploratory conversations with interested partners about current issues, a robust collaborative group has coalesced.

With participation of over 60 local individuals, the Trinity County Collaborative Group (Collaborative) has held monthly meetings since late 2012, developed and adopted a charter, formed and operated working groups, and identified an initial pilot project through which they would like to test and grow their "zone of agreement" around management on public forest lands. The Collaborative plans to use the project as an adaptive management opportunity, learning about social, ecological, and economic dimensions of their agreements in order to expand this concept to a County-wide project covering the major road systems that make up the primary transportation system.

The Collaborative would like to increase the amount of active management on National Forest System (NFS) lands in Trinity County. Their areas of agreement focus on forest conditions and management actions that impact humans and communities the most. Outside of supporting direct community wildfire protection, for which the Trinity County Fire Safe Council has developed and implemented a Community Wildfire Protection Plan (signed 2017), the Collaborative has developed support for treating fuels along high-use roads as well as adjacent to and within plantations, in order to improve forest health/habitat quality, reduce fuels, improve fire suppression capability through safe ingress/egress, and improve human safety. The Collaborative believes that all of the major roads within the County transportation system (federal, state, local, private) should be treated over time. In order to develop the ability to treat that large of a landscape, a pilot project is necessary to understand the constraints, opportunities, and tradeoffs associated with the Collaborative's internal agreements. Resource protection issues, local economic capability, and the processes and mechanisms for working with federal agencies will be part of the learning process.

Purpose and Need for Action

The purpose of the Pilot Project is two-fold. The first set of goals is to create safer ingress/egress for the local communities, improve forest health/habitat quality, reduce fuels, improve human safety, provide resilient plantations that can withstand insect and disease as well as wildfire, and create local economic opportunities. The second set of goals is focused on developing and implementing a pilot project that tests the three priorities of the Trinity County Collaborative: "*Social Acceptance, Ecological Function, and Economic Sustainability."* By evaluating project outcomes across these three priorities, the Shasta-Trinity National Forest (Forest) plans to work with the Collaborative, other interested publics, and Tribes to use what is learned while planning and implementing the pilot project to develop a subsequent County-wide project.

Social Need:

- *Reduce hazardous fuel loading in strategically located roads and plantations in high-risk areas to enhance defensibility, ingress and egress between the communities of Hyampom and Hayfork.*

The desired fuel profiles would increase the probability of safe ingress and egress by limiting fire behavior to surface fire and limit the probability of crown fire initiation and propagation under the 90th percentile fire weather conditions common in mid- to late-summer. The desired fuel

profiles would have discontinuous surface fuel loading (to reduce potential flame length), disconnected ladder fuels (to limit the possibility of torching), increased canopy spacing (to limit crown fire spread), and retention of large trees of fire resilient species (to reduce post-fire mortality and restore historic stand structure). The desired condition would also increase the likelihood that firefighters could safely engage a fire directly with hand tools.

Both Indian Valley (2N10) and Butter Meadows (3N08) roads are strategic to the communities of Hayfork and Hyampom. Predominant wind patterns move from west to east towards Hayfork from Hyampom. Any fire that starts in the west will most likely move towards and threaten Hayfork. There is a need to reduce fuels along roads and within and adjacent to plantations in this area to break up fuel continuity and allow for increased fire suppression capability by providing safe ingress/egress. Additionally these roads provide a secondary evacuation route for the dispersed community of Hyampom in case of an emergency; therefore there is a need to improve and maintain the secondary evacuation route for this community. Increasing fire suppression capability and maintaining evacuation routes will help lead to improved public safety while also increasing social acceptance for actively managing National Forest System (NFS) lands in Trinity County.

- *Protect and maintain significant investments the Forest Service has made in plantations and roads.*

There is a need for protection of significant investments the Forest Service has made in planting trees post-harvest and post-fire (plantations) and in the road system that access the project area. By reducing the stocking level of these plantations and creating a buffer between natural stands and plantations, the opportunity for these investments to mature and contribute to mature forest habitat will increase the odds of reaching the Forest's goals of ecosystem restoration at a larger scale.

Ecological Need:

- *Restore ecological resilience within plantations and strategic road buffers across land allocations within the project area.*

The desired conditions within plantations include healthy and more structurally diverse stands including openings, with reduced stand densities that allow for individual tree health and vigor to more quickly achieve late successional characteristics. Stands conditions would allow for safe reintroduction of fire, where appropriate, and would be more resilient to wildfire and endemic levels of disease and insect activity.

Vegetative communities in the project area vary from late-seral Klamath mixed-conifer, Ponderosa pine, and oak woodlands, to early-seral stands and single storied plantations. This variety of vegetative communities provides habitat for Northern spotted owl and numerous other species of concern. Implementing strategic forest thinning along roads and within and adjacent to plantations is needed to help reduce the threat of negative impacts from wildfire balanced with accelerating the development of late seral stage forest conditions in plantations. This project will complement the Westside Plantation Project and the Middle Hayfork Pre-Commercial Thin project that thin plantations near the project area.

Economic Need:

- *Provide biomass utilization and forest commodities in the form of timber, post and pole, fuelwood/firewood, or wood chips where economical.*

The utilization of forest products in Trinity County primarily centers on commercial saw timber and firewood. The capacity of the timber industry in the County has been diminished over the last two decades with multiple mills closing. The impacts to the economy of the County have been dramatic including reduced direct employment, payroll, tax revenues, property values, and ancillary impacts to supporting industries and the service sector. In order to support the local forest management and wood products industries, and the communities dependent upon them, there is a need to provide sustainable opportunities for local resource planners, loggers, truckers, forestry services, sawmill and firewood businesses and workers, and utilize the associated wood resources to manufacture a range of products that generate employment and revenues for local workers, businesses, and the County.

Pilot/Learning Need:

- *Gain a strong understanding of options and tradeoffs in balancing and integrating Trinity Collaborative agreements and priorities identified in the Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan) direction and T&E species protections through project planning (pre-NEPA and NEPA), design and implementation.*

A wide range of long-standing conflicts and challenges have hampered the development of projects that jointly meet the demands of local stakeholders and broader public stakeholders interested in the management of NFS lands in Trinity County. Coupled with high planning complexity due to the presence of multiple resource concerns, it has been challenging to develop projects that achieve broad social support while meeting Forest Plan goals. This project is meant to test and learn from a collaborative approach to project development and build on the emerging consensus that the proposed actions represent.

Steep slopes, high implementation costs, and limited timber value from small diameter trees impede economically efficient management approaches across NFS lands in Trinity County. A need exists in learning how to design prescriptions and contracting strategies that balance costs and revenues. Achieving this balance will stretch appropriated federal funding further in terms of acres and linear road distance treated with effective fuels reduction.

Shasta-Trinity National Forest Land and Resource Management Plan (1995)

The project area falls within the Indian Valley/Rattlesnake Management Area and contains Adaptive Management Area (AMA), Matrix, Riparian Reserve, and Late Successional Reserve land allocations. The Butter Creek watershed portion of the project occurs within the South Fork Trinity River Key Watershed.

The Proposed Action and alternatives are guided by the (Forest Plan). The Forest Plan provides programmatic management direction for site-specific projects through Goals and Standards & Guidelines which apply to all land allocations. Goals and Standards and Guidelines that apply include:

Goals

- Manage the Forest's transportation system to facilitate resource management activities, protect wildlife, meet water quality objectives and provide recreational access (page 4-4).
- Implement practices designed to maintain or improve the health and vigor of timber stands, consistent with the ecosystem needs of other resources (page 4-5).
- Provide a sustained yield of timber and other wood products to help support the economic structure of local communities and to supply regional and national needs (page 4-5).
- Restore fire to its natural role in the ecosystem… (page 4-4).
- Maintain water quality to meet or exceed applicable standards and guidelines (page 4-6).

Standard and Guidelines

- Retain roads on the Forest Service transportation system that will be needed for future activities such as forest health projects, timber management, fire protection, recreation management, and wildlife management (page 4-17).
- Perform road maintenance activities to meet a variety of management objectives…Schedule road maintenance activities according to the following priorities: (1) to provide for user safety; (2) to meet contractual and legal obligations; (3) to protect natural resources; and (4) to provide an efficient transportation system (page 4-16 and 4-17).
- Activity fuels[1] that remain after meeting wildlife, riparian, soil, and other environmental needs will be considered surplus and a potential fire hazard. (page 4-17).
- Natural fuels[2] will be treated in the following order of priority: (1) public safety; (2) high investment situations (structural improvements, powerlines, plantations, etc.); (3) known high fire occurrence areas; and (4) coordinated resource benefits… (page 4-18).
- Plan and implement fuel treatments emphasizing those treatments that will replicate fire's natural role in the ecosystems (page 4-18).
- Analyze each land disturbing project for its effect on the appropriate 2nd or 3rd order watershed to prevent excessive cumulative impacts on stream channel condition and water quality (page 4-25).
- Implement Best Management Practices (BMPs) for protection or improvement of water quality for applicable management activities (page 4-25).
- Implement Forest Soil Quality Standards and the Forest supplement of the Regional BMPs for areas identified as having highly erodible soils (page 4-25).
- Forest Soil Quality Standards, in relation to ground cover, soil organic matter, and soil porosity will be used to protect soil productivity (page 4-25).
- Give full recognition to the tendency for erosion, mass land movement, and severe watershed damage potential when implementing vegetation management and related land management activities (page 4-25).
- Assess potential impacts of vegetation management, road construction, and related activities on slope stability and watershed condition for areas identified as moderately or highly unstable (page 4-25).

[1] Those fuels created by the proposed treatments.
[2] Existing fuels already on the landscape prior to proposed treatments.

- Timber stand improvement projects will emphasize maintaining or improving growth, and healthy, vigorous trees, through release and thinning (page 4-27).
- Use commercial thinning to maintain or improve tree health and vigor and to provide a marketable supply of wood products (page 4-27).
- Survey and evaluate habitat for Threatened, Endangered, and Sensitive (TE&S) species at the project level in coordination with U.S. Fish and Wildlife Service (page 4-30).

Land Allocations

Land allocations that treatments are proposed in include:

- Late Successional Reserves,
- Matrix,
- Adaptive Management Area ,
- Riparian Reserve, and
- Administratively Withdrawn (Unroaded Non-motorized Recreation and Limited Roaded Motorized Recreation).

Late Successional Reserve (LSR)

Late Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain functional, interacting, late-successional, and old-growth forest ecosystem (Forest Plan 4-37).

General management direction for LSR lands is found on pages 4-37 through 4-44 of the Forest Plan. Supplemental direction may be found in the Shasta-Trinity's Forest-Wide Late-successional Reserve Assessment (USDA Forest Service 1999; LSRA). This project partially occurs within the northeastern portion of the South Fork LSR.

Forest-wide LSRA

As directed by the Northwest Forest Plan Record of Decision Standards and Guidelines (page C-11), the Shasta-Trinity National Forest prepared a Forest-wide LSRA in 1999. The LSRA's Chapter 4 outlines management recommendations, including activity design criteria for late successional reserves and managed late successional areas. Activity design criteria 3, 4, and 7 will be used in the development and implementation of this project.

Matrix

The purpose of this prescription is to provide for an area where there are moderate evidences of the sights and sounds of humans, and to obtain an optimum timber yield of wood fiber products from productive forest lands within the context of ecosystem management. This prescription emphasizes recreational opportunities associated with developed road systems and dispersed and developed camp sites. Fish and wildlife management which supports the recreational use of wildlife species (hunting, fishing and viewing) is also emphasized. Timber stands will be managed to obtain optimum growth and yields using cultural practices which control competing vegetation, obtain stocking control and minimize mortality. Vegetation manipulation will

provide habitat for those wildlife species primarily dependent on early and mid-seral stages (Forest Plan 4-65 and 4-67).

Adaptive Management Areas

The overall objective for AMA is to learn how to manage on an ecosystem basis in terms of both technical and social challenges, and in a manner consistent with applicable laws. The AMAs are intended to contribute substantially to the achievement of objectives for these standards and guidelines as they appear to other allocations. This includes provision of well-distributed late successional habitat outside of the reserves, retention of key structural elements of late-successional forests on lands subjected to regeneration harvest and restoration and protection of riparian zones as well as provision of a stable timber supply (Forest Plan 4-69).

Riparian Reserves

Riparian Reserves are to maintain and restore the distribution, diversity and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted. Prescriptions within Riparian Reserves are also to be consistent with the other eight Aquatic Conservation Strategy Objectives for riparian health maintenance and enhancement (Forest Plan 4-53).

The Riparian Reserve designation overlays the other land allocations including LSR and Matrix, and generally are designated within 300 feet of both sides of the high water levels on perennial fish-bearing streams or 150 feet of both sides of high levels for perennial non-fish bearing streams and 100 feet for intermittent/ephemeral streams that display annual scour. Direction for management of Riparian Reserves is found in the Forest Plan (pages 4-53 through 4-60) and the Northwest Forest Plan ROD (pages C30 through C38). Management activities may occur in Riparian Reserves when they are in support of or do not adversely affect maintenance of riparian-dependent resources (i.e. fish, wildlife and water).

Administratively Withdrawn – Unroaded Non-motorized Recreation

The purpose of this prescription is to provide for semi-primitive non-motorized recreation opportunities in unroaded areas outside existing Wildernesses while maintaining predominantly natural-appearing areas with only subtle modifications. Also emphasized in this prescription is retention of old-growth vegetation and management of wildlife species requiring late seral stage conditions. This prescription also applies to designated Wild segments of Wild and Scenic Rivers outside of Wildernesses (Forest Plan 4-45).

Administratively Withdrawn – Limited Roaded Motorized Recreation

The purpose of this prescription is to provide for semi-primitive motorized recreation opportunities, while maintaining predominantly natural-appearing areas with some modifications. Recreational and visual resources are important values; semi-primitive activities are emphasized. Managing for old-growth vegetation and wildlife species requiring late seral stages is also an important consideration (Forest Plan 4-46). This prescription also applies to designated Scenic segments of Wild and Scenic River.

Proposed Action

The proposed Pilot Project area is located along two strategic roads within the Hayfork Ranger District of the South Fork Management Unit on the Shasta-Trinity National Forest (see project map, attached) in order to create a roadside safety corridor. The proposed treatments will cover approximately 4,000 acres (focusing on implementing thinning treatments along the Indian Valley (2N10) and Butter Meadows (3N08) roads, and within and adjacent to plantations) to contribute towards ecological and economic sustainability and social benefit along approximately 40 miles of roads open to the public.

Treatments will include thinning (Table 1), with utilization of any material as appropriate, to achieve a long-term ecological condition that can withstand insect and disease outbreaks and wildfire. Treatment prescriptions will match land management allocation objectives of the Forest Plan, while incorporating resource protection measures to minimize significant impacts. The proposed action includes three management activities:

1) The roadside and plantation fuel reduction buffer (roadside safety corridor) will be 300 feet total width (not including the width of the system road, shoulder to shoulder) and will be adjacent to the Indian Valley (2N10) and Butter Meadows (3N08) roads, and around the plantations that intersect the roadside buffer (see attached map). Width of the buffer on either side of the road could change but would not exceed 300 feet total width; e.g. if conditions lend to a wider treatment on the uphill side, the uphill side may be treated up to 275 feet from the road and the downhill side would be treated 25 feet from the road. The minimum treatment area along either side of the road will be 25 feet. Fuel reduction treatment will occur within the entire buffer, where warranted. Where fuel reduction prescriptions result in utilizable material, products will be offered.
    a) Thin existing stands to retain the best, healthiest trees that have a high canopy capacity (those with the strongest crown to bole ratio, have the highest needle or leaf cover and provide the most shade to the forest floor), capable of maintaining those objectives for a long period of time within the buffer area.
        i) Designate for removal suppressed, intermediate, and codominant conifer trees that compete with the best, healthiest trees that have a high canopy capacity, retaining an overall basal area objective by stand type. This is to reduce fuel-ladders, and competition for available site resources.
        ii) Those trees that provide valuable wildlife structures may be considered as part of the shade retention objective.
        iii) Outside the dripline of larger trees designated for retention, retain vigorous clumps of healthy intermediate mixed conifer trees to provide for more complex stand diversity and a source of future mature trees.
        iv) Retain hardwood trees. Culture hardwood clumps to one to three dominant stems where appropriate.

Table 1A: Stand Type Thinning Objectives

Stand Type	Thinning Objective	Retention Preference
Upland Mixed Conifer Stands (UMCS)	D + 6 Space trees less than 16 inches dbh 17 to 22 feet from one another. See Appendix A for Spacing over 16 inches dbh. Target Residual TPA determined by the diameter of leave trees (range from approximately 28 to 105 trees per acre for stands with a Quadratic Mean Diameter [QMD] less than 35 inches)	• all uninfected (white pine blister rust (WPBR)) sugar pine • vigorous Douglas-fir • all uninfected (mistletoe) ponderosa/Jeffrey pine • incense cedar • white fir
Upland Pine Stands (UPS)	D + 10 Space trees less than 16 inches dbh 21 to 26 feet from one another. See Appendix A for Spacing over 16 inches dbh. Target Residual TPA determined by the diameter of leave trees (range from approximately 22 to 70 trees per acre for stands with a QMD less than 35 inches)	• all uninfected (WPBR) sugar pine • all uninfected (mistletoe) ponderosa/Jeffrey pine • vigorous Douglas-fir • incense cedar • white fir
High Value Wildlife Stands (HVWS)	D + 4 Space trees less than 16 inches dbh 15 to 20 feet from one another. Maintain 10 clusters (3 to 5 trees) per acre outside of the dripline of dominant and codominant trees. These clusters would be considered an individual tree of 16 inches for spacing (15 to 20 feet). See Appendix A for Spacing over 16 inches dbh. Target Residual TPA determined by the diameter of leave trees (range from approximately 25 to 109 trees per acre for stands with a QMD less than 35 inches)	• all uninfected (WPBR) sugar pine • vigorous Douglas-fir • all uninfected (mistletoe) ponderosa/Jeffrey pine • incense cedar • white fir
Riparian Reserve Stands	Understory treatment Remove all trees less than 10 inches dbh located within the dripline of a larger trees outside of Equipment Exclusion Zones (EEZ). Space trees less than 10 inches dbh 15 to 20 feet from one another.	• Retain all true-riparian vegetation
Oak Woodlands	Thin multi-stemmed oaks down to 1 to 3 stems, depending on size. Remove all conifers from oak dominated areas, except dominant and predominant trees (these are generally exceeding 24 inches in diameter).	• Retain all oak individuals. Culturing and pruning of oaks is permitted.

(**D+** is a silvicultural prescription that uses the diameter of the tree in inches and takes that same number in feet plus the additional spacing to meet the objectives. QMD is average stand diameter.)

b) Reduce fuel loading to 10-20 tons/acre (consistent with Forest Plan Management Prescriptions) including brush and down logs.

   i) The intent is to have less fuel loading along the road and the treatment will feather into the natural stand with more fuel loading away from the road.[3]
   c) Where necessary, create a control line on the outside edge of treatment areas where necessary to maintain fuel reductions with prescribed fire. The control line may be constructed by hand or dozer as appropriate for containment and site impacts.
   d) Retain all snags >19" dbh (including cull trees) unless the snag could be considered a hazard tree. A hazard tree, within striking distance of the road and likely to fall in the direction of the road given the topography and natural lean of the tree, would be removed. Hazard trees that are felled outside the treatment buffer would be left onsite.
   e) Where appropriate, stumps of freshly cut conifers over 14-inches in diameter will be treated with an EPA-registered borate compound to prevent spread of Heterobasidion root disease.
2) Young plantations that were not included in the Westside Plantations Project or Middle Hayfork Project are included in this project.
   a) Thin trees to an average 20-foot spacing (110 TPA). In addition, reduce surface fuels by methods listed below.
3) Road maintenance/reconstruction as well as landing and access ramp construction or utilization would occur as necessary.
   a) Access ramps (less than 100 feet in length) may be utilized to access existing or newly constructed landings. Ramps will be decommissioned following use.
   b) Legacy sediment sources identified in the project area will be restored.

Fuels Treatment Methods

Within all vegetation treatment areas, the following methods may be used to reduce the fuel loading:

- Hand felling, which cuts down trees and/or brush using hand tools such as a chainsaw.
- Mastication, which pulverizes or chops standing trees and logs into small particles. This treatment can include mowing, mulching, or chipping.
- Chipping, which pulverizes or chops trees, brush, and logs into small particles, redistributing surface fuels.
- Pruning, which removes lower limbs up to eight feet from the ground or half the live crown.
- Hand piling slash, which concentrates slash and surface fuels in small piles.
- Machine piling slash, which utilizes equipment to pile slash and surface fuels into larger piles.
- Pile burning, which is the prescribed ignition of created piles.
- Jackpot burning, which is a burning method used to reduce heavy intermittent fuel concentrations, where fuels are not continuous enough to carry a broadcast fire.
- Broadcast burning, which is a burning method used where heavy continuous fuel concentrations exist.

[3] Surface fuels includes all fuels (live and dead) that could influence surface flame length and/or contribute to crown fire initiation: Leaf/needle litter, dead and down, live brush, and small trees up to 8 inches DBH. This includes tree limbs up to a height of 8 feet.

The proposed project is expected to demonstrate the range of forest stands, terrain, planning options and challenges, resource impacts, and economic hurdles that will be expected across the larger Trinity County landscape.

Maintenance

The treatments will be maintained over time to retain the fuels reduction benefits, improve establishment of planted trees, and guide the development of the forest toward desired conditions. The maintenance treatments will occur over the same areas where initial treatments are proposed.

Roadside safety corridors are characterized by little canopy closure, and discontinuous ladder fuels and surface fuels. The roadside buffers will need to be maintained over time. It is recommended that these areas be monitored every 3-7 years to determine if it still meets the fire behavior objectives. When the area begins to exceed the fire behavior objectives the following treatments will need to be implemented either alone or in combination: broadcast burning, cut live and dead brush, reduce ladder fuels 8 inches DBH or less under drip lines of remaining trees, machine/hand pile, and pile burning.

Within plantations, the primary goal of maintenance will be the growth of planted trees as well as developing resilience to fire, disease, and insects. A release for growth would occur approximately 10 years after treatments and would thin conifers if stand density was higher than expected (125 to 200 trees to the acre) due to competing vegetation. When the plantations begin to exceed the fire behavior objectives the following treatments will be implemented where appropriate either alone or in combination: broadcast burning, cut brush and ladder fuels 8 inches DBH or less under drip lines of remaining trees, machine/hand pile, and pile burning.

Monitoring

Monitoring will rely on plots, primarily photo series and/or planar intercept, every 3-7 years to assess and quantify fuel loading and profiles in order to maintain the fire behavior objectives listed above.

Best Management Practices monitoring will take place as appropriate based on the schedule of implementation.

Working with the Trinity County Collaborative Group, the design and implementation of the treatments will be monitored to assess the effectiveness of the proposal and the opportunities to adapt future proposals.

Resource Protection Measures

To minimize impacts to resources in the area from this project, the following resource protection measures are incorporated into all action alternatives, unless otherwise noted.

Wildlife and Fish

1) Limited operating periods (LOPs)[4] will be implemented to avoid potential impacts to northern spotted owls, fishers, bald eagles, northern goshawks, peregrine falcons, and anadromous fish:
   a) For northern spotted owls (*Strix occidentalis caurina*), limited operating periods (LOPs) are established in collaboration with the US Fish and Wildlife Service to limit potential disturbance or harm to this species. A February 1 through September 15 LOP will be imposed on activities directly manipulating suitable nesting/roosting or foraging (NRF) habitat, and a February 1 to July 10 LOP will be imposed on activities causing loud and continuous noise disturbance or smoke within 0.25 miles of suitable NRF habitat. Most of the project area would have one of these LOPs .
      i) Surveys to protocol can be used to generate new breeding activity results. If subsequent protocol-compliant surveys show no nesting activity within 0.25 miles of proposed activities at the time of implementation or by mutual agreement with the US Fish and Wildlife Service (FWS), LOPs may be lifted. If surveys indicate that northern spotted owls are not resident in the area and LOPs are lifted, the FWS will be informed of the change.
   b) For bald eagles (*Haliaeetus leucocephalus*), a limited operating period (LOP) will be imposed from January 1 to August 15 within 0.5 miles of all known bald eagle nest sites. This LOP will apply to all activities causing loud and continuous noise disturbance or smoke that will potentially disturb this species during its breeding season. If a bald eagle management plan has been written for a specific nesting site, the provisions of the plan will be incorporated into the project design. Surveys to protocol can be used to generate new breeding activity results. If subsequent protocol-compliant surveys show no nesting activity within 0.5 miles of proposed activities at the time of implementation, LOPs may be lifted.
   c) For peregrine falcons (*Falco peregrinus*), a limited operating period (LOP) will be imposed from February 1 to August 15 within 0.5 miles of all known falcon nest sites. This LOP will apply to all activities causing loud and continuous noise disturbance or smoke that will potentially disturb this species during its breeding season. If a peregrine falcon management plan has been written for a specific nesting site, the provisions of the plan will be incorporated into the project design. Surveys to protocol can be used to generate new breeding activity results. If subsequent protocol compliant surveys show no nesting activity within the nest site management zones at the time of implementation, LOPs may be lifted.
   d) For northern goshawks (*Accipiter gentilis*), a limited operating period (LOP) will be imposed from February 1 to August 15 within 0.5 miles of all known goshawk nest sites.

[4] Limited operating periods refer to the period of time when operations are limited or restricted. It occurs during times when species are more sensitive to disturbance.

This LOP will apply to all activities causing loud and continuous noise disturbance or smoke that will potentially disturb this species during its breeding season. Surveys to protocol can be used to generate new breeding activity results. If subsequent protocol-compliant surveys show no nesting activity within 0.5 miles of proposed activities at the time of implementation, LOPs may be lifted.

e) Field personnel and equipment will not enter waterways where anadromous fish are determined to be spawning or eggs would be incubating, as determined and indicated by a fish biologist. Restricted time periods are generally from October 15 through April 15. Additional restrictions may be appropriate for waterways containing spring Chinook salmon (*Oncorhynchus tshawytscha*) and summer-run steelhead (*Oncorhynchus mykiss*), as determined by a qualified fish biologist (focus is protection of spawning and incubating eggs). Maps will be provided to those responsible for implementation.

f) To avoid potential watershed-related impacts, including effects to anadromous fish, timber harvest activities will occur between April 15 and October 15 (Normal Operating Season). Timber harvest activities may occur outside of the Normal Operating Season if authorized by the appropriate Line Officer when: 1) weather conditions are favorable, 2) erosion control work is current, and 3) acceptance of recommendations from the district fisheries biologist and/or hydrologist. The dates of operations may also be constrained by Wet Weather Operations Guidelines.

2) Within a core area (0.5 miles from nest stand) of an NSO territory the following measures will apply in all suitable NSO nesting/roosting, and foraging habitat areas:[5]

a) The High Value Wildlife Stands prescriptions, described above, can occur within the first 50 feet of the road.

b) Beyond the first 50 feet from the road, up to the maximum extent of the road buffer:

i) Tree removal greater than 8 inches DBH will be limited to trees posing a hazard to open roads and/or operations. Hazard is determined by factors including tree condition and height, and terrain (slope) (on flat ground in this area, a typical tree distance considered potentially hazardous to a road is 150 feet). Beyond this distance, trees posing a hazard to operations or haul routes will be cut to abate the safety hazard, and will be subject to removal only where their retention would pose a safety hazard if left on-site as logs.

ii) In areas that exceed the fire behavior objectives the following treatments will need to be implemented either alone or in combination: broadcast burning, cut brush and reduce ladder fuels 8 inches DBH or less under drip lines of remaining trees.

iii) In NSO nesting/roosting habitat, no tractor based operations will occur.

c) Except where it poses a hazard to operations or haul routes, all coarse woody debris (CWD) in advanced states of decay (snag and log decay classes 3-5[6]) will be retained. Where it is available, at least 15 tons of coarse woody debris (CWD) per acre will be retained for wildlife benefit (CWD = snags 15 inches or greater in diameter and logs

[5] This categorization is based on data collected during field visits, aerial photo interpretation, and the E-veg owl habitat suitability database.

[6] Class 3: Intact, soft logs in full contact with the soil; no branches or bark; high moisture content; very high biological activity in fully penetrated sapwood; some biological activity in heartwood. Class 4: Intact to fractured cubical heartwood and bark; log mostly buried in the soil; very high moisture content; extremely high biological activity, mostly microorganisms and sub-microscopic invertebrates; fully penetrated by mychorrizal fungi and roots.

greater than 20 inches diameter and 10 feet long). In the areas where there is a need to retain CWD in addition to decayed snags and logs to meet this standard, snags and logs with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention.

3) If during project layout or implementation caves are found in units or within 250 feet of unit boundaries, an earth scientist would be consulted and a buffer flagged on the ground identifying an equipment exclusion zone, and/or modification of the prescription in the vicinity if needed. No project activities will take place within 250 feet from caves, mines and mine adits to protect known or potential sensitive bat species (Townsend's big-eared bat, pallid bat, and fringed myotis) roost sites. Activities necessary to address safety threats (e.g. hazard trees to the road or operations) will prevail over this measure.

Botany

4) All plant populations requiring protection from proposed treatments will be flagged on the ground. These sites will be shown on project implementation maps as control areas.
   a) Ditch cleaning and brushing associated with project related road maintenance and using heavy equipment with a blade will be restricted to no higher than 24 inches above the ground to reduce potential impacts to Niles' and Stebbins harmonia plants that can occupy cut and fill slopes. Ditches may be cleaned without restriction up to a height of 24 inches above the bottom of slopes. Vegetation above 24 inches that obstructs vehicle line of sight will be manually cut and removed without disturbing the roadside.
   b) Handline construction will not occur within known populations of *Lilium rubescens* and *Eriogonum libertini*.
   c) Heavy equipment use will be excluded from naturally occurring grassy or gravelly openings within late-seral conifer forest.
   d) Trees will be directionally felled away from rock outcrops or exposed bedrock greater than 10 feet in diameter to protect Canyon Creek Stonecrop.
   e) Hazard trees will be felled where found in all Type 1 and Type 2 serpentine habitats (see below).
      i) Serpentine Habitat Type #1. Open areas with a high content of serpentinite and peridotite minerology, sparsely vegetated with occasional shrubs and few or no conifers:
         (1) Exclude heavy equipment from these sites. No machinery off of well-established tracks, routes, or roads; No vehicle or equipment staging, log decking, skid trail, landing, or access ramp construction through these sites. Previously constructed landing sites that are heavily disturbed may be used after botanist approval.
         (2) No pile burning.
         (3) Hazard trees will be left in place after falling.
         (4) No landing construction or use, unless approved by a botanist.
      ii) Serpentine Habitat Type #2. Forest or shrubland habitats with widely spaced trees (30 trees per acre or less). There may be scattered large conifers, as well as distinct clumps of small to large shrubs; all of which may have burned in concentrations producing hazard trees. Forest or shrubland habitats with a moderate or high number of openings between trees. There may be scattered clumps of large mature trees

[Jeffrey pine, incense cedar, hardwoods], as well as distinct clumps of small to large shrubs; all of which may have burned in concentrations producing hazard trees.

(1) Exclude heavy equipment from these sites. No machinery off of well-established tracks, routes or roads; No vehicle or equipment staging, log decking, skid trail, landing or road construction through these sites. Previously constructed sites that are heavily disturbed may be used after botanist approval.
(2) No pile burning.
(3) Felled hazard trees will be left in place unless they can be removed from the site by full suspension or endlined by equipment that remains on well-established existing roads.
(4) No landing construction or use, unless approved by a botanist

f) Machine piling, skid trails, new landing construction, and pile burning treatments will be excluded from within known Sensitive botanical populations.

5) If any newly listed or unknown occurrences of special status botanical species are found within the analysis area during project activities, work will stop in the area and the district biologist will be contacted immediately to determine appropriate action.

Noxious Weeds/Non-native Invasive Species

6) Use standard timber sale contract provisions to ensure appropriate equipment cleaning, which addresses cleaning of ground-disturbing equipment, in the construction and service contracts to help prevent the introduction and spread of weed species into and out of the project area.
7) Prior to implementation of mechanical operations each season, sites containing starthistle, spotted knapweed, dyer's woad and goat grass may be managed to reduce the potential for weed spread. High priority weed sites are those that contain invasive species that are known to be very invasive, limited in geographic extent within the project area, and/or are within close proximity to high value natural resources such as Sensitive plant populations. Management options include but are not limited to scheduling treatments before seed has set, avoiding infested sites with designated control areas, handpulling weed sites before operations begin, and covering infested sites. Strategic scheduling of operations will occur between infested and non-infested areas. Managed noxious weed sites will be identified on a map and flagged for exclusion from equipment staging and other project activities.
8) To discourage establishment of invasive weeds in selected highly impacted or disturbed areas within the project area, locally genetic native grass and forb seed may be spread where there is heavy soil disturbance.

Riparian Reserve Areas

9) Table 2 below provides the minimum Riparian Reserve boundary widths by category of stream and/or waterbody (Forest Plan 4-53, 4-54). In some cases, field evaluation may reveal that the Riparian Reserve is actually wider than indicated by the GIS layer. Riparian Reserves will be flagged on the ground.

Table 2. Minimum Riparian Reserve Boundary Widths, by Stream or Waterbody Category.

Stream and/or Waterbody Category	Extent of Riparian Reserve Width	Equipment Exclusion Zones (EEZ)
Seasonally flowing or intermittent streams or wetlands < 1 acre or unstable or potentially unstable areas	A distance equal to the height of 1 site potential tree on each side of the channel, or 100 feet on each side of the channel, wetland or unstable area (200 feet total), whichever is greatest.	When water is flowing within intermittent streams, the EEZ will be within 100 feet on each side of the channel. When the stream is not flowing, the EEZ will be within 50 feet on each side of the channel.
Fish-bearing perennial streams and lakes or natural ponds	A distance equal to the height of 2 site potential trees on each side of the channel or edge of the lake or pond, or 300 feet on each side of the channel or edge of the lake or pond (600 feet total), whichever is greatest.	Within 150 feet of the stream
Perennial non-fish-bearing streams and wetlands > 1 acre	A distance equal to the height of 1 site potential tree on each side of the channel or edge of the wetland, or 150 feet on either side of the channel or edge of the wetland (300 feet total), whichever is greatest.	Within 150 feet of the stream

10) All heavy equipment is excluded from EEZs, except at designated crossings. All EEZs will be flagged on the ground and identified as "streamside buffer" on project maps.
11) An EEZ is applied to any wetland (including wet meadows, seeps, fens, and springs), stream inner gorge, and unstable and potentially unstable land features. For inner gorges and unstable and potentially unstable land features (active landslides) an additional 50-foot EEZ buffer will be applied.
12) Hand treatments are permissible in EEZs up to the high water mark. Hand treatments will have limited ground disturbance in the EEZ and will not disturb riparian plant species such as big leaf maple (*Acer macrophyllum*), willow (*Salix* spp.) and alder (*Alnus* spp.).
13) When snags are felled within the intermittent stream EEZ, they will be left unless there is a site specific reason for removing them, such as desired coarse woody debris levels are met and heavy fuel loading occurs (greater than 20 tons/acre), or the tree is within 200 feet upstream of a culvert and threatens stability of road infrastructure. If heavy fuel loading occurs, 20 tons/acre of the largest CWD will be left. In the stream channel, the small material that can clog a culvert resulting from fallen trees within 200 feet upstream will be removed.
14) Riparian Reserves that are unmapped will be identified and protected, prior to and/or during implementation, in accordance with appropriate protection measures (see Table 2 above). Upon field review, if ephemeral streams show no sign of annual scour or deposition (i.e., upland swales) they do not meet the Forest Plan definition of a seasonal or intermittent channel (they are not Riparian Reserves).
15) Hand piling and pile burning will not occur within the EEZs. However fire may be allowed to back into these areas, providing the spread will be controllable.

Landings, skid trails, and crossings within Riparian Reserve

16) Existing landings within the Riparian Reserve can be reused; however, the area of disturbance will not be increased and these features will be tilled[7] and seeded[8] following use where they do not need to be retained as part of the road system.[9] No new landings will be constructed within the Riparian Reserve. No existing landings within EEZs will be used unless they are connected to a system road.[10]
17) No full bench skid trails will be constructed within the Riparian Reserve.
18) Any designated intermittent and perennial stream equipment crossings (except Forest Service system roads) will be reviewed in the field and approved by an earth scientist, fish biologist, botanist, or designee prior to use, and will avoid unstable areas. These features will be rocked crossings designed to maintain fish passage on existing and potential fish-bearing streams.[11] They will be reshaped and stabilized following use. If intermittent stream crossings are left in place for wet weather operations, they will be removed during the following dry season.
19) During construction of temporary stream crossings, disturbance to existing live vegetation will be minimized to the maximum extent possible. When the crossing is rehabilitated, fill will be pulled back from the crossing so that the original stream level is re-established when the culvert is removed.
20) No skid trails will be built on active landslides or inner gorges, and no existing skid trails on active landslides or inner gorges will be used.

Water drafting

21) Water drafting will:
    a) occur at existing sites with existing access;
    b) minimize adverse effects on stream channel stability and instream flows needed to maintain riparian resources;
    c) minimize sedimentation;
    d) minimize impacts to fish habitat;[12] and
    e) utilize a fish screen to prevent fish entrapment.
22) Water drafting sites that are not within habitat that is accessible to anadromous salmonids will be identified first and will be given priority for use. When needed, water drafting may occur in habitat accessible by anadromous salmonids. In all cases where water drafting occurs within anadromous salmonid habitat, 2001 National Marine Fisheries Service's (NMFS) Water Drafting Specifications[13] will be adhered to. Any new drafting sites will be

[7] Tilling refers to the use of machinery to break the soil surface to loosen compacted soil and increase permeability.
[8] See specifications on tilling in the Soils/Hydrology Resource Protection Measure section below and specifications on seeding in the Noxious Weed Resource Protection Measure section above.
[9] Wide areas along roads used as landings are often also used as turn outs for vehicle traffic and are considered part of the road system. Where these occur within Riparian Reserves, they will be retained.
[10] Road pullouts are sometimes used as landings.
[11] Forest Plan Standard and Guideline, page 4-55 in the Forest Plan.
[12] Forest Plan Standard and Guideline, page 4-58 in the Forest Plan.
[13] The 2001 National Marine Fisheries Service's (NMFS) Water Drafting Specification document is located at http://www.westcoast.fisheries.noaa.gov/publications/hydropower/water_drafting_specification_guidelines.pdf.

approved by a Forest Service Fish Biologist and/or hydrologist prior to use. In addition, when drafting water the following rules apply.[14]

a) Allow drafting from fish bearing streams only where immediate downstream discharge is maintained at 1.5 cubic feet per second (CFS) or greater.
b) Allow drafting from ephemeral streams, intermittent streams, wetlands or constructed ponds provided that sufficient water quantity and quality remains to support associated wildlife species and riparian values.
c) Never allow drafting to remove more than 75 percent of constructed pond water.

Soils and Hydrology

23) Relevant BMPs have been identified for this project.
24) Retain downed logs in decay classes 3 and 4[15] for soil fertility purposes whenever possible.
25) Mechanical skidding equipment is generally restricted to slopes less than 40 percent. On short steep pitches (less than 45% slope, and less than 100 ft in length), mechanical skidding equipment is restricted to slash covered primary skid trails using flexible track skidders with low ground pressure equipment.
26) Wet weather logging is permitted on soils with compaction hazard rating of moderate or less with restrictions (see Field Guide to Soil Moisture Conditions for Operability of Logging Equipment (Rust 2015) and Shasta-Trinity Wet Weather Soil Compaction Hazard Rating (Rust 2008)).
27) Ground-based mechanical equipment will only operate on fine-textured soils (identified as medium and heavy soils in the Field Guide to Soil Moisture Conditions for Operability of Logging Equipment (Rust 2015)) when the top 8 inches of soil are dry (identified as slightly moist soils in the Field Guide), as evaluated by Forest soil scientist or designee. Areas along roads proposed for treatments that have this soil type will be identified on a map for use by the Timber Sale Administrator.
28) Post-treatment total soil cover should be between 50 and 70 percent averaged across the treatment area on metamorphics with at least 50 percent cover (in places that it existed prior to treatment) as fine organic matter (duff, litter, plant leaves/needles, fine slash (<3 inch material), etc.). On granitics, soil cover should be greater than 90 percent (in places that it existed prior to treatment) with at least 50 percent cover as fine organic matter. Areas along roads proposed for treatments that have this soil type will be identified on a map.
29) In treatment areas susceptible to logging-based soil displacement[16] (shallow granitic soils) keep skidders (rubber tired or fixed track) on slopes less than 35%. Avoid displacing topsoil (typically 2 to 4 inches) and exposing erosive subsoils on areas greater than 15 by 15 feet outside of skid trails, unless mulched. Only operate on these soils when soil is no wetter than the moist category identified in the Field Guide to Soil Moisture Conditions for Operability

[14] Forest Plan Standard and Guideline, page 4-25 in the Forest Plan.
[15] Class 3: Intact, soft logs in full contact with the soil; no branches or bark; high moisture content; very high biological activity in fully penetrated sapwood; some biological activity in heartwood. Class 4: Intact to fractured cubical heartwood and bark; log mostly buried in the soil; very high moisture content; extremely high biological activity, mostly microorganisms and sub-microscopic invertebrates; fully penetrated by mychorrizal fungi and roots.
[16] Detrimental soil displacement is excessive topsoil moved laterally from its usual place by blading or pushed aside by machines or logs, most likely to occur on steep shallow soils.

of Logging Equipment (Rust, 2015) down to 8 inches. Areas along roads proposed for treatments that have this soil type will be identified on a map.

30) All material will be skidded with one end suspended wherever possible to minimize soil gouging and potential damage
31) Reuse existing primary skid trails and landings where available and practical to minimize soil displacement and concentrated surface flow.
32) Skid trails will not run along the axis of intermittent channels or swales, and long runs on steep slopes will be avoided.
33) Till (subsoil to 18 inches) all landings identified for rehabilitation, access ramps, and main skid trails (up to 200 feet entering landings) that have fine textured soils with a winged-subsoiler following completion of all management activities. Tilling will be completed outside of the tree drip-line so as not to impact root systems. For rocky soil, scarification[17] will be used to restore sites. These areas should be mulched (weed free straw, wood chips or on-site organic material) at a rate of 1.5 to 2 tons per acre (approximately 4 to 6 inches in depth) over a minimum of 75 percent of the exposed soils, where necessary to prevent erosion.
34) Minimize soil erosion by water-barring skid trails. Install waterbars on contour at major breaks in slope along the skid trails and control lines.
35) New landings will be located on gentle slopes (<20%) to minimize earthwork, and will avoid unstable areas, steep slopes below landslide benches, and slope positions where they could deliver sediment to streams. Cuts and fills would not exceed 5 feet in height, unless field reviewed and approved by an earth scientist beforehand.
36) Pull organic materials out of fill slope of landings to prevent collapse.
37) Landings will have natural, non-constructed designs. If non-constructed design is not feasible, landings will be constructed to adequately drain through crowned surface and directed drainage with catchment structures (rock armoring and/or silt fences with straw bales may be used as necessary). All new landing fill slopes and access road fill slopes (>100 sq. ft.) would be mulched initially, and then the mulch would be maintained throughout the life of the project; mulch may be weed-free straw, or landing slash. Areas with new road and landing fill will be rehabilitated after treatments are complete.
38) New landings will occur in areas that are generally open or deforested, whenever possible.

Road measures

39) Roads rutted by operations shall be spot rocked or otherwise suitably repaired. Drainage structures shall be protected or repaired as necessary. Road surfaces expected to be used during wet weather, in areas crossing serpentine soils, should be rocked to prevent roadbed deformation (rutting) during wet conditions.
40) Dispose of unsuitable slide and excess fill in stable, non-floodplain sites. Fill material will be inspected by a botanist, weed specialist, or designee prior to moving for presence of noxious weeds. If noxious weeds are present, they will be treated prior to moving the fill, and the disposal site will be monitored in the future and treated as necessary.

[17] Scarification involves light disturbance of the soil surface, as opposed to deep tilling to 18 inches.

41) Roads will be maintained to intercept, collect, and remove water from the road surface and surrounding slopes in a manner that reduces concentrated flow in ditches, culverts, and over fill slopes and road surfaces. Road maintenance will occur as needed to ensure that drainage features are fully functional. All culverts will be clean and functioning. Berms will be removed unless specifically designed for erosion control purposes. Ditches will be cleaned only as needed to keep them functioning.
42) Road reconstruction may occur to the degree necessary to provide adequate drainage and prevent direct discharges from road drainage structures to nearby waterbodies. Drainage structures will be upgraded as necessary to avoid direct discharges into nearby waterbodies to the extent practicable.
43) Stream crossings may be reconstructed to the degree necessary to disconnect the road drainage from the waterbody to avoid or minimize water and sediment from being channeled into surface waters and to dissipate concentrated flows. Reconstructed stream crossings will sustain bankfull dimensions of width, depth, and slope and maintain streambed and bank resiliency and continuity through the structure. Culverts will be aligned with the natural stream channel.
44) Instream work will be scheduled during dry or low flow periods. Small, low ground pressure equipment and hand labor will be used in streams to the extent practicable. Equipment will be well maintained, and vegetable oil or other biodegradable hydraulic oil will be used for equipment hydraulics wherever practicable when operating in or near water.

Naturally Occurring Asbestos

45) Mechanical operations in ultramafic soils should operate on slightly moist or moist soils to reduce dust levels that could contain naturally occurring asbestos (NOA).
46) All field personnel who will be working near earth-moving, or other dust-producing activities in areas underlain by ultramafic rock will be informed that NOA commonly occurs in that rock, and they will be provided with a map showing such areas.
47) Dust production will be prevented/minimized by applying effective dust abatement measures, such as applying water or other dust inhibitors to materials being worked; operating when soil conditions are moist enough to limit dust, but not be so wet as to result in rutting or sedimentation into streams; reducing vehicle speed; and avoiding dust-producing activities on excessively windy days. Ensure road surfaces are wet. Where needed, wet road surfaces with water trucks using sprinklers to reduce dust.
48) Where dust prevention in ultramafic areas is not possible, appropriate protection and mitigation measures will be applied so that Forest Service and contractor field personnel will not inhale such dust. These include closing windows on vehicles and turning on positive ventilation systems, or use of appropriate air filtration masks if other measures are not adequate.
49) If rock/soil waste is generated from ultramafic areas, such waste will be disposed of only where the underlying rock is also ultramafic, and it will not be mixed with other waste from non-ultramafic areas. When transporting NOA-containing material, avoid overloading trucks and cover with tarps to reduce dust. Ensure that piles of excavated material are wet and cover with tarps to reduce dust.

Fuel Treatment Operations

50) Fuel reduction activities (machine piling using brush rakes or grapple heads) should retain >50 percent of the existing surface duff (Forest Plan Soil Quality Standards.
51) For machine piling on fine textured soils, weight restrictions should be set 6.0 PSI ground pressure or less and operate on dry[18] soils less than 40 percent slope.
52) Excess activity created slash and existing surface fuels (where they exceed 16 inches in depth and are greater than 10 tons per acre) may be machine or hand piled or masticated on slopes less than 40 percent and hand piled on slopes greater than 40 percent.
53) Ground-based mastication operations on fine-textured soils (clay loams, clays, silty clay loams) should comply with the following restrictions:
    a) Operate with low ground pressure equipment (less than 6psi) on slopes less than 40% when soil moisture is no wetter than the moist category on medium soils and slightly moist category on heavy soils to 8 inches in depth as identified in the Field Guide to Soil Moisture Conditions for Operability of Logging Equipment (Rust, 2015; evaluated by Forest soil scientist or designee).
    b) Drive over masticated material to form a cushion to reduce displacement and compaction.
    c) For equipment with ground pressure over 6psi, operations on slopes less than 40% will be conducted when the soils are no wetter than the slightly moist category for medium and the dry category for heavy soils down to 8 inches as identified in the Field Guide to Soil Moisture Conditions for Operability of Logging Equipment (Rust, 2015).
54) All machine piles shall be reasonably compact (averaging 10 feet high by 10 feet wide in size) and free of soil to facilitate burning and shall be constructed of such size and at such distance from green trees so that burning shall not result in unnecessary damage to residual timber.
55) Hand piles will be placed in a dispersed pattern (i.e., not stacked above one another), averaging 6 foot high by 6 foot wide in size. Piles may be covered to facilitate efficient burning.
56) Fuel loading will be reduced to an average of 20 tons/acre in the Limited Roaded Recreation prescription, consistent with the Forest Plan (page 4-47).

Burning

57) Burning prescriptions will be developed to result in mortality of no more than 10% of residual live trees 20 inches dbh or greater in late-seral habitats.

Air Quality

58) Prescribed burning will be implemented in accordance with California Code of Regulations, Title 17, Smoke Management Guidelines for Agricultural and Prescribed Burning. A Smoke Management Plan will be completed and submitted to the appropriate Air Quality Management District for approval prior to implementing any prescribed fire.
59) Use of prescribed fire will comply with Forest Service, California Air Resources Board and North Coast Unified Air Quality Management District guidelines.

[18] Dry is defined as less than 18% moisture by weight.

60) To mitigate the potential for significant impacts and nonconformity, the Forest will coordinate prescribed fire in the airsheds to distribute the burn days appropriately throughout the year. The coordination will include communication with the North Coast Unified Air Quality Management District (AQMD), personnel for adequate burn days, based on current air quality within the basin and weather conditions. The South Fork and Trinity River Management Units will develop a plan that meets the objectives of the management unit and maintain conformity with the State Implementation Plans (SIP) and Clean Air Act (CAA).
61) Monitor smoke transport and dispersion during prescribed fire.

Cultural Resources

62) All archeological sites shall be clearly delineated prior to implementing any associated activities that have the potential to affect historic properties. Historic property boundaries shall be delineated with coded flagging and/or other effective marking.
63) If mechanical equipment is used in treatment buffers, all recorded cultural and archaeological resources will be flagged and avoided following the site protective guidelines in the Region 5 Section 106 Programmatic Agreement[19]. However, vegetation within these sites can be removed using hand tools, a grapple, or a rubber tired skidder so long as ground disturbance is minimized and features avoided. Treatments within individual cultural and archeological sites must be approved and monitored by a Forest Service archeologist.
64) Woody material may be chipped within the boundaries of historic properties so long as the staging of chipping equipment on-site does not affect historic properties and staging areas are specifically approved by the Heritage Program Manager (HPM) or qualified Heritage Program staff.
65) Monitoring by heritage program specialists or tribal representatives may be used to enhance the effectiveness of protection measures.
66) The recorded historic properties will be noted as controlled areas to be avoided. Contract administrators will insure these protective measures are followed.
67) If new cultural resources are discovered, all work in the vicinity will cease until qualified Heritage Program staff examines and assesses the resource. Appropriate measures will be undertaken to protect the new resource as activities resume.

Pathology

68) To prevent the spread of Annosus root disease (also known as Heterobasidion root disease) in areas where the disease has been documented, all freshly cut living or recently killed conifer stumps greater than 14-inches (stump diameter) will be treated with an EPA-registered borate compound (e.g. Sporax® or Cellu-Treat®) within 24 hours after the tree is cut. Whenever possible, stumps will be treated immediately after cutting.

[19] Programmatic Agreement among the U.S.D.A Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Processes for Compliance with Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region (Programmatic Agreement) 2012

69) Do not apply borate directly to water, or to areas where surface water is present. Do not contaminate water when disposing of equipment washwaters or rinsate.

General Protection Measures

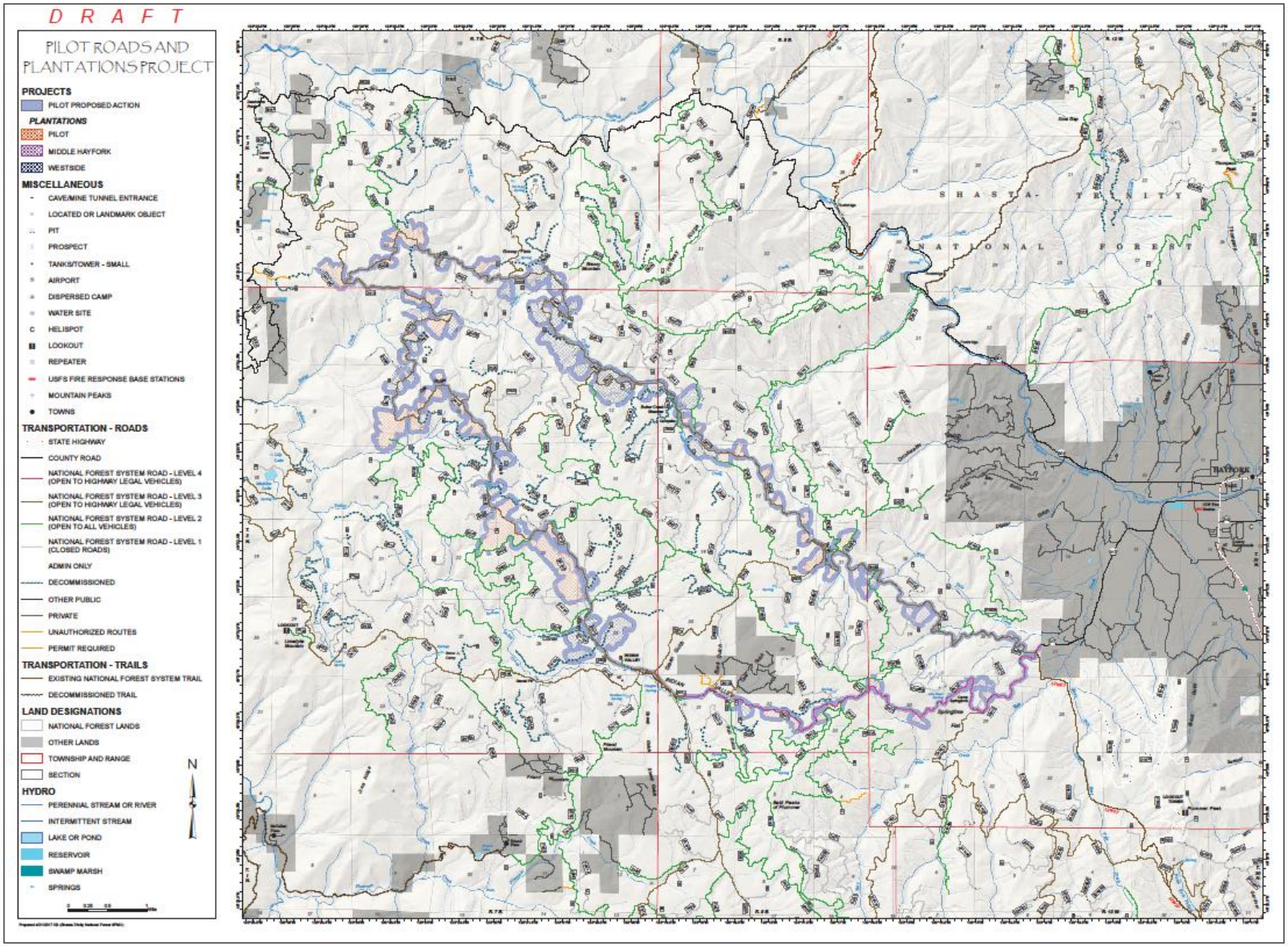
70) The final locations of landings, access ramps and any burning activities will be mapped for a Forest geologist prior to completing operations.
71) Implementation shall not unnecessarily damage young growth or other residual live trees.
72) Felling and bucking shall be done to minimize breakage of logs removed during the commercial operations.

Appendix A

Table 1-A. Spacing requirements by Stand Type and Diameter of trees with resulting trees per acre (TPA).

Diameter	D + 4 Spacing for HVWS	TPA @ D + 4 for HVWS	D + 6 Spacing for UMCS	TPA @ D + 6 for UMCS	D + 10 for UPS	TPA @ D + 10 for UPS
6	10		12		16	
7	11		13		17	
8	12		14		18	
9	13		15		19	
10	14		16		20	109
11	15		17		21	
12	16		18		22	
13	17		19		23	
14	18		20	109	24	
15	19		21		25	70
16	20	109	22	92	26	65
17	21		23		27	
18	22		24		28	
19	23		25	70	29	
20	24		26		30	48
21	25	70	27		31	
22	26		28		32	
23	27		29		33	
24	28		30	48	34	
25	29		31		35	36
26	30	48	32		36	
27	31		33		37	
28	32		34		38	
29	33		35	36	39	
30	34		36		40	27
31	35	36	37		41	
32	36		38		42	
33	37		39		43	
34	38		40	27	44	
35	39	28	41		45	22

* Note: Green highlighted line in above table indicates the thinning threshold for small trees in each stand type.


D R A F T
PILOT ROADS AND PLANTATIONS PROJECT
PROJECTS
PILOT PROPOSED ACTION
PLANTATIONS
PILOT
MIDDLE HAYFORK
WESTSIDE
MISCELLANEOUS
CAVE/MINE TUNNEL ENTRANCE
LOCATED OR LANDMARK OBJECT
PIT
PROSPECT
TANK/STOWER - SMALL
AIRPORT
DISPERSED CAMP
WATER SITE
HELISPOT
LOOKOUT
REPEATER
USFS FIRE RESPONSE BASE STATIONS
MOUNTAIN PEAKS
TOWNS
TRANSPORTATION - ROADS
STATE HIGHWAY
COUNTY ROAD
NATIONAL FOREST SYSTEM ROAD - LEVEL 4 (OPEN TO HIGHWAY LEGAL VEHICLES)
NATIONAL FOREST SYSTEM ROAD - LEVEL 3 (OPEN TO HIGHWAY LEGAL VEHICLES)
NATIONAL FOREST SYSTEM ROAD - LEVEL 2 (OPEN TO ALL VEHICLES)
NATIONAL FOREST SYSTEM ROAD - LEVEL 1 (CLOSED ROADS)
ADMIN ONLY
DECOMMISSIONED
OTHER PUBLIC
PRIVATE
UNAUTHORIZED ROUTES
PERMIT REQUIRED
TRANSPORTATION - TRAILS
EXISTING NATIONAL FOREST SYSTEM TRAIL
DECOMMISSIONED TRAIL
LAND DESIGNATIONS
NATIONAL FOREST LANDS
OTHER LANDS
TOWNSHIP AND RANGE
SECTION
HYDRO
PERENNIAL STREAM OR RIVER
INTERMITTENT STREAM
LAKE OR POND
RESERVOIR
SWAMP MARSH
SPRINGS
N
SHASTA-TRINITY
NATIONAL FOREST
HAYFORK